WHAT IS CLAIMED IS:

1. An apparatus for cooling an electronic module comprising:

a cold plate thermally coupled to the module;

a heat sink thermally coupled to said cold plate; and

a means for decoupling a heat transfer path from said heat sink to said cold plate when said cold plate is functioning.

2. The apparatus of claim 1, wherein said means for decoupling includes a fastener configured to clamp said cold plate to said heat sink, said cold plate intermediate said heat sink and the module.

3. The apparatus of claim 2, wherein differences in thermal expansion between the fastener and said heat sink will make and break a clamp force when said cold plate is not functioning and functioning, respectively.

4.The apparatus of claim 2, wherein said fastener has a lower coefficient of thermal expansion than said cold plate.

5. The apparatus of claim 1, wherein said fastener is fabricated of one of Invar, Kovar, and alloys of the foregoing.

6. The apparatus of claim 1, wherein said cold plate is fabricated of one of copper and aluminum.

7. The apparatus of claim 1, wherein said cold plate has a thickness of at least 10mm.

8. The apparatus of claim 7, wherein mating thermal surfaces between said cold plate and said heat sink have a flatness within 0.5mil.

9. The apparatus of claim 2, wherein said fastener is torqued to provided a desired clamping force between said heat sink and said cold plate at a temperature seen in application when said heat sink is a primary cooling means of the module.

10. The apparatus of claim 1, wherein said decoupling occurs when said cold plate is cooling at temperatures between about zero to about 25°C.

11. The apparatus of claim 10, wherein a clamping force between said cold plate and said heat sink is relieved due to the thermal contraction of a base material of said cold plate being larger than that of said means for decoupling.

12. The apparatus of claim 2, wherein said means for decoupling includes said fastener configured to clamp said cold plate to said heat sink by applying a torque to said fastener and one of a biasing member configured to bottom out at high temperature conditions and said fastener fixedly disposed relative to said cold plate, allowing intimate contact between said cold plate and said heat sink and breaking such contact when said torque on said fastener is removed due to a cold plate temperature lower than high temperature conditions.

13. The apparatus of claim 12, wherein said biasing member is a low force spring.

14. A method for cooling an electronic module comprising:

coupling at least one of a cold plate and the electronic module in thermal contact to said heat sink;

using a fastener configured to clamp said at least one of said cold plate and the electronic module to said heat sink; and

torqueing said fastener down to apply a first clamping force between the heat sink and said at least one of said cold plate and the electronic module at a reference temperature;

wherein said fastener is configured to apply a second clamping force between said heat sink and at least one of said cold plate the electronic module in direct proportion to a temperature change of the assembly relative to the reference temperature.

15. The method of claim 14, wherein when coupling said heat sink in direct thermal contact to said cold plate, further compries:

decoupling a heat transfer path from said heat sink to said cold plate when said cold plate is functioning.

16. The method of claim 15, wherein said decoupling further comprises:

using a fastener configured to clamp said cold plate to said heat sink, said cold plate intermediate said heat sink and the module.

17. The method of claim 16 wherein differences in thermal expansion between the fastener and said heat sink will make and break a clamp force when said cold plate is not functioning and functioning, respectively.

18. The method of claim 14, wherein said fastener has a lower coefficient of thermal expansion than said cold plate.

19. The method of claim 14, wherein said fastener is fabricated of one of Invar, Kovar, and alloys of the foregoing.

20. The method of claim 14, wherein cold plate is fabricated of one of copper and aluminum.

21. The method of claim 15 further comprising:

torqueing said fastener to provide a desired clamping force between said heat sink and said cold plate at a temperature seen in application when said heat sink is a primary cooling means of the module.

22. The method of claim 15 further comprising:

applying a torque to said fastener; and

one of;

using a biasing member configured to bottom out at high temperature conditions; and

fixedly disposing said fastener relative to said cold plate,

wherein said applying said torque to said fastener allows intimate contact between said cold plate and said heat sink and breaking such contact when said torque on said fastener is removed due to a cold plate temperature lower than high temperature conditions.

23. The method of claim 14, wherein said coupling said heat sink in thermal contact to the electronic module is via a cap defining one end of the electronic module forming an assembly.

24. An apparatus for cooling an electronic module comprising:

a heat sink thermally coupled to the electronic module via a cap defining one end of the electronic module; and

a fastener configured to apply a clamping force with respect to the electronic module and said heat sink formed assembly, said clamping force varying directly as a function of temperature of the assembly.

25. The apparatus of claim 24, wherein said fastener has a lower coefficient of thermal expansion than said cap.

26. The apparatus of claim 24, wherein said fastener is fabricated of one of Invar, Kovar, and alloys of the foregoing.

27. The apparatus of claim 24, wherein said fastener is torqued to a first torque to provide a desired clamping force between said heat sink and the electronic module at an ambient temperature and increases to a second torque seen in operation when said heat sink is a primary cooling means of the electronic module.

28. The apparatus of claim 24, wherein said clamping force between the electronic module and said heat sink is increased due to the thermal expansion of a base material of said cap coupled to said heat sink being larger than that of said fastener.